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United States Department of Agriculture,

DIVISION OF VEGETABLE PHYSIOLOGY AND PATHOLOGY.

NEW SPRAYING DEVICES.

A COMBINED HAND SPRAYER AND SYRINGE.

Ever since the practice of spraying has come to be generally followed, the need has been felt for a small hand apparatus suitable for use where only a few plants are to be treated. Many farmers, gardeners, and others are prevented from adopting the treatments now recommended for the fungous diseases of plants by the fact that apparatus suitable for the work costs more than the value of the crops to be saved would warrant. Where only a small number of grapevines, a few fruit trees, or perhaps some garden plants, such as

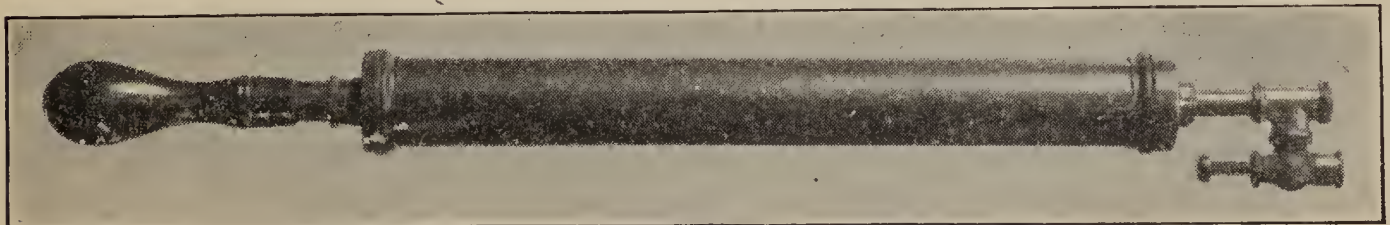


FIG. 1.—Hand sprayer complete.

potatoes, beans, etc., are to be treated, the owner sometimes hesitates to purchase an apparatus costing five to ten dollars. To obviate this objection the writer has devised a simple hand sprayer (fig. 1), the retail price of which should not exceed \$2 or \$2.50. This sprayer consists of an ordinary hand syringe, such as florists use, with an arrangement by which a Vermorel nozzle provided with a separate intake may be attached. Ordinarily the plain syringes have a cap on the end containing numerous small orifices through which the liquid is forced in the form of fine streams.

To change the syringe to a sprayer a cap (fig. 2 *c*) with a larger opening is put on in place of the usual one and into it is screwed the Vermorel nozzle. The nozzle proper (fig. 2 *n*) necessarily has a very

small orifice, and to fill the syringe through this would require too much time, hence a larger opening is made (fig. 2 *o*) and into this a ball valve is fitted (fig. 2 *b*). This latter is so arranged that when the handle of the syringe is drawn up the liquid is drawn in through the opening, and when forced down the ball valve closes the intake and the liquid issues from the nozzle in the form of a mist-like spray.

The apparatus may be used for applying fungicides of all kinds, and also for other purposes where the object is to obtain a uniform distribution of a liquid in the form of a fine spray. In greenhouses it will prove valuable for whitewashing benches, shading glass, and other purposes. Any brass worker can make it, and with ordinary care it should last as long as the syringe itself.

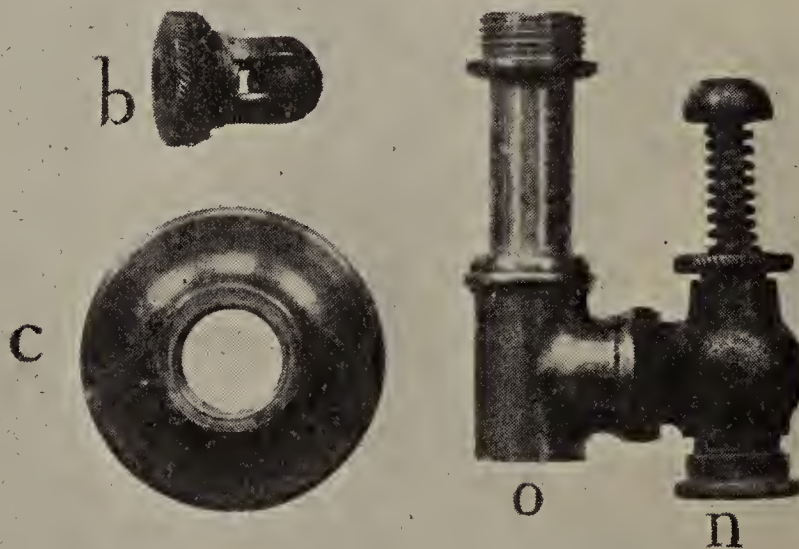


FIG. 2.—Parts of hand sprayer : *c*, cap; *n*, nozzle; *o*, opening closed by ball valve; *b*, ball valve.

A GREENHOUSE NOZZLE FOR THE APPLICATION OF WATER.

Several years ago while conducting experiments with roses under glass with Mr. Robert Miller, then foreman of Strauss's greenhouses in this city, the writer's attention was called to the necessity of a small and cheap apparatus that could be used in syringing plants with water. During the winter, and at other times, syringing plants under glass is absolutely necessary, and the chief aim in such work is to apply the minimum amount of water with the maximum amount of force. In small establishments hand syringes are used, but where the work is extensive they are of course out of the question. Where a

pressure of 30 to 40 pounds is available the practice of using the finger on the open end of an ordinary three-quarter-inch hose is generally followed, but this is not always satisfactory, for frequently new men are brought into service and it takes them some time to learn just how to manage the hose so as to apply a small amount of water. To overcome this difficulty Mr. Miller devised a number of nozzles, which, in connection with the suggestions from the writer, finally developed into the form shown in fig. 3. The nozzle consists of a casting turned to the desired length and flattened at the end, as shown in the figure. Through this flattened end a narrow slit is made. It is important to have this opening absolutely true through-



FIG. 3.—Tip and greenhouse nozzle complete.

out, otherwise the water as it issues from the nozzle will be broken up into streams. As the tips come from the factory they are not always satisfactory and it has been occasionally found necessary to smooth the opening with a narrow, flat file. A few tests, however, will soon show just what is wanted in the way of a spray, which should consist of a flattened mass of water, about the shape of an ordinary gas flame, but of course very much larger. At a distance of 2 to 3 feet from the end of the tip the spray breaks up into innumerable small drops, but with force enough to effectively answer the purpose for which it is intended.

The spray tip proper is attached to a brass fitting, which in turn screws on to the end of a three-quarter-inch hose. The apparatus is very effective for spraying roses, as it readily serves to keep the leaves in a thoroughly healthy condition and at the same time wets the beds but little. It is also very useful for violets, as with a pressure of 35 to 40 pounds the leaves of the plant can be readily turned over and thoroughly washed without soaking the crowns and the bed. In spraying some plants, particularly violets, it has been found advantageous to use a lance 18 inches long made of a piece of one-half-inch brass pipe. This increases the reach and enables the operator to place the water to better advantage on plants which under ordinary conditions would be beyond arm's length. The apparatus can be made for 50 cents and will be found a useful instrument wherever there is sufficient water pressure to insure a proper amount of force.

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Approved:

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